

## HABITS AND HABITAT DIFFERENCES IN TWO RACES OF TRAILL'S FLYCATCHER

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I FIRST became interested in ecological segregation in races of Traill's Flycatcher (*Empidonax traillii*) in 1931, when Roger T. Peterson called my attention to the difference between the songs of Traill's Flycatchers breeding on the Appalaehian Plateau near Jamestown, New York, and those of the Lake Erie plain only a few miles to the north. The birds of the plateau sang slurred, three-noted songs, with the accent on the second syllable, and the third syllable slurred to the extent that it was not distinctly separated from the second. This has been interpreted by Peterson as 'way-be-o.' The birds of the lake plain uttered a distinctly two-syllabled, explosive 'fitz-bew' with a sneezy quality and with the accent on the first syllable. Peterson suggested at the time that two races of Traill's Flycatcher might actually be represented and urged me to investigate it. This I have only recently had occasion to do.

In addition to the song differences noted above, Bent (1942:204) comments on differences in nests and nesting sites between Traill's Flycatchers breeding in the Mississippi Valley and adjacent states, and those breeding east of the Appalaehian Mountains and farther north. He remarks that nests of the former are much like those from west of the Rocky Mountains. There are descriptions by a number of observers quoted by Bent, which indicate that there is a tendency for nests of Traill's Flycatchers of the prairie regions to be located in dry, brushy habitats, as well as brushy swamps, and to be much more compact in construction, similar to those of the Yellow Warbler (*Dendroica petechia*), as compared with the more loosely constructed nests similar to those of the Song Sparrow (*Melospiza melodia*). The latter type of nest is characteristic of Traill's Flycatchers of the northeastern and Appalaehian Mountain regions. Arthur A. Allen has written me that he has found both the compact, Yellow Warbler type and the more bulky Song Sparrow type of nests in the Ithaca, New York area. He asserts that the compact nest is constructed by the lowland breeding birds with two-syllabled songs, while the loosely constructed nest is made by highland-breeding flycatchers with three-noted songs. He further comments that he has never heard the two-noted, lowland type of song in the Adirondacks or eastern Canada where the three-syllabled note is much in evidence. Aretas A. Saunders, who has made extensive records of bird songs, informs me (*in litt.*) that the three-noted song is the only one of the well-known songs he has heard given by Traill's Flycatchers in the Adirondacks, Vermont, Connecticut, and northwestern New Jersey. However, in summer after breeding is established these birds

call "que dee, two syllables, with the second higher pitched than the first." Birds at Sandy Lake, Minnesota, gave this 'que dee' song also. At Chillicothe, Missouri, and Watertown, South Dakota, Saunders heard Traill's Flycatchers giving the 'fitz-bew' song. At Fertile, Minnesota, he recorded a song that was halfway between the 'fitz-bew' and 'way-be-o' songs. McCabe (1951:91) described as 'creel' a note which precedes the 'fitz-bew' of southern Wisconsin Traill's Flycatchers when at the peak of singing.

McCabe (1951:90) organized various interpretations of Traill's Flycatcher songs from the literature according to whether they were three- or two-syllabled. He noted that they did not appear to fall into geographically segregated groups but pointed out that this could have been the result of difference in interpretation of sounds by different observers. It would seem quite likely that some of McCabe's interpretations of published descriptions of the songs might be interpreted differently. It may be that distinction between the quality of the sound, as well as placement of the accent, is more useful than an attempt to break it down into syllables for purposes of correlating songs with distinct breeding populations. It is well known to field ornithologists that it is difficult to express in words the differences in bird call notes which are quite obvious to the practiced ear. It is the opinion of several ornithologists including Aretas Saunders, Arthur Allen, Roger Peterson, Robert Stewart, and Chandler Robbins, with whom I have discussed this problem that there is, in fact, a difference between songs of the breeding Traill's Flycatchers of the midwestern region in general and those of the Appalachian highlands and the New England states.

The above observations are indicative of two distinctly different populations of the Traill's Flycatcher, distinguishable on the basis of song, nest-building habits, and geographic distribution. One of these breeds primarily in the bog-shrub habitats of the more boreal coniferous forest region of northern and eastern North America, and the other primarily in the brushy habitats of the interior prairies and plains. A study of large series of breeding specimens from eastern North America has shown that two morphologically distinct races are represented by these two segments of the population of Traill's Flycatcher, *Empidonax traillii traillii* and *E. t. campestris* (Aldrich, 1951:195), which have been shown to differ so noticeably in their habits.

It is possible that the western prairie population of Traill's Flycatcher was formerly more completely isolated from the eastern boreal population, but has recently come into closer contact by infiltration from the west, along the plain of the Great Lakes, since removal of the original forest cover has produced more satisfactory habitat for it. The relatively slight physiographic and ecological barrier which exists today between the Interior Lowlands and Appalachian Plateau physiographic provinces in western New York State ap-

parently has been sufficient to prevent complete genetic intermingling of these two populations as indicated by both specimens and field observation of song differences. It even seems that both races breed close together in one Lake Plain situation in northwestern Ohio, segregated merely by habitat differences. This was noted by Campbell (1936:164) who described differences in songs and nests of birds which nested in dry scrubby situations as compared with the more usual breeding habitat in wet brushy stream borders. Richard B. Fischer (1950) has given some evidence that the 'fitz-bew'-singing race of Traill's Flycatcher may have even penetrated to the Atlantic coast and is establishing itself in areas south of the former range of the species at the lower elevations, although no specimens have been available for confirmation. In any case we know from specimens and field observation that both the pale interior prairie type with the 'fitz-bew' song and the dark northeastern and highland type with the 'way-be-o' song breed in close proximity today in western New York State, and the correlation of their distribution with the sinuous boundary between plain and plateau results in extremely interdigitated ranges. A parallel situation in mammals would seem to be that of the white-footed mouse, *Peromyscus maniculatus*, in which the range of the prairie race *bairdii* interdigitates with the range of the eastern boreal forest race *gracilis* in Michigan (Burt, 1946:206), and the race *osgoodi* with *artemisae* in Montana (Murie, 1933:4), as a result of occurrence of grasslands interspersed with forest areas. This situation of highly interdigitated ranges of two subspecies correlated with ecological differences has been noted in other species of birds, such as the Song Sparrows in the San Francisco Bay area (Marshall, 1948:209). Knowledge of these facts further suggests the probability that the ranges of *Empidonax traillii adastus* Oberholser and other western races of this species may have an ecological segregation, accounting for the confusion that has existed in the separation of races in the West. Further investigation in regions where two subspecies appear to overlap are needed to throw more light on this interesting problem.

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